Fall 9-1-2006

PHIL 411.01: Philosophy of Science

Armond J. Duwell

University of Montana - Missoula, armond.duwell@umontana.edu

Philosophy 210 Philosophy of Science
MW 12:40-2:00

Professor Armond Duwell
Office: LA 154
Phone: 406-243-6281
email: armond.duwell@mso.umt.edu
Office hours: Tues 1-3

DESCRIPTION:

We will examine the nature of scientific inquiry: its methods, aims, and results. Issues to be explored will include: What relations are there between science and philosophy? What is the status of the knowledge science produces? What counts as 'truth', 'objectivity', and 'progress' in science? Can we differentiate between scientific and pseudoscientific claims? What are scientific revolutions? We will examine these issues both from the perspective of traditional core notions and contemporary challenges to these. In developing topics, examples will be drawn from the history of the development of scientific theories, with special emphasis on the physical sciences.

REQUIREMENTS:

Reading: approximately 100 pages/week

Attendance: Required. It is required because this course is meant to be discussion intensive. Moreover, because the class is discussion intensive, it is essential that you do the readings.

Writing:

Two brief take-home essays: 20% of grade each. Note: not completing a draft on time will lower your score one full letter grade.

Final, take-home essays covering the material of the lectures, readings, and discussions: 40% of grade.

Group presentations 20% of grade

Due dates for assignments are firm deadlines. They are announced well in advance, so please plan accordingly. There is no room in the schedule to fall behind in either reading or writing assignments.

Essays: The text of the first two take home essays should be between 800 and 1000 words in length, typed, double-spaced, 12 point font, page numbers, stapled, and word count included with your name. Provide citations for all quotations and sources used (not

included in word count). Do not use extensive quotations. Papers shorter than 800 words or longer than 1000 (with a ten-word allowance) can at best receive a grade of 'C'.
I will give out essay topics in advance of their due dates

Presentations: These will be made in groups of 2 students. Please do not simply summarize the readings. They should have two parts: 1. address what you take to be the main problems of the author(s) and their proposed solutions (taking not more than ½ hour) and 2. provide a set of problems formulated by your group for discussion. You should provide a handout (with your names written on it) to me and the class with a list of the problems for discussion.

Final Essays: I will provide a set of essays covering the entire class. There will be some choices in what you can answer. There are no restrictions on length, but you will need to follow the instructions for formatting given above.

Plagiarism:

What is plagiarism? It is using other person's ideas or words, or writings, without giving credit to them.

To avoid plagiarism, you must give credit whenever you use

* another person's idea, opinion, or theory;
* any facts, statistics, graphs, drawings—any pieces of information—that are not common knowledge;
* quotations of another person's actual spoken or written words; or
* paraphrase of another person's spoken or written words (http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml).

For more information and useful examples, see
http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml

Remember, plagiarism is an offence that can result in course failure.

Classroom courtesy:

Please turn off cell phones when you come into class. If you have to leave early, please indicate that to me before class begins, and let me know why you must leave early.

Tentative Syllabus:

I: Problems in Natural Philosophy

Introduction: The Scientific Revolution & the Nature of Scientific Knowledge

8/28, 8/30 Readings: Burtt, Chapter 1
Matthews, Aristotle, pp. 5-32

The Copernican Revolution

9/6, 9/11, 9/13 Readings: Burtt, Chapters II & III
Matthews: Copernicus, pp. 33-44 Galileo pp. 53-80

Mathematization, Rationalism, & the Mechanical Philosophy

9/18, 9/20 Readings: Burtt, Chapter IV
Matthews: Descartes, pp. 87-97 (up to Part I)
Descartes: Meditations I & II

Experimentation & Empiricism

9/25, 9/27 Readings: Burtt**,** Chapter VI
Matthews: Bacon, pp. 45-52 Boyle, pp. 109-123

The Newtonian Synthesis

10/2 Readings: Burtt, Chapters VII, Sections 1, 2, 3, 4; VIII
Matthews: Newton, pp. 133-159

10/4 Writing workshop, DRAFT DUE

10/6 PAPER DUE 4 pm, my Philosophy Dept mailbox

Problems in the Foundations of Newtonian Mechanics

10/9, 10/11 Readings: Hume (handout)
Kant: Introduction, Preamble, First Part

II: Problems in Contemporary Philosophy of Science

Demarcation & Scientific Change: Logical Positivism & Its Critics

Readings:

10/16, 10/18 Kuhn, Structure Chapters I - VI

10/23, 10/25: Kuhn, Structure Chapters VII - XIII

10/30, 11/1: Kuhn, Structure, Postscript

Scientific Revolutions

Readings:

11/6 Hacking, Paper I

11/8 Hacking, Paper II

11/13 Hacking, Paper III

11/15 Writings Workshop, DRAFT DUE

11/17 PAPER DUE 4 pm, my Philosophy Dept mailbox

11/20 Hacking, Paper IV

11/27 Hacking, Paper V

11/29 Hacking, Paper VI

12/4 Hacking, Paper VII

12/6 Hacking, Paper VIII

12/14 FINAL ESSAY EXAM DUE 3:30, my Philosophy Dept mailbox

REQUIRED BOOKS

E. A. Burtt: *The Metaphysical Foundations of Modern Science* (Humanities Press)
Ian Hacking: *Scientific Revolutions*
Thomas Kuhn: *The Structure of Scientific Revolutions* (Chicago)
Michael R. Matthews, ed.: *The Scientific Background to Modern Philosophy* (Hackett)

ONLINE MATERIAL

Descartes' Meditations: http://www.classicallibrary.org/descartes/meditations/

Kant's Prolegomena:
http://www.mnstate.edu/gracyk/courses/phil%20306/kant_materials/prolegomena1.htm#info

Note that a Google search for "Descartes Meditations" and "Kant Prolegomena" will find these pages quickly.